

What is claimed is:

1. An electrical switch comprising:
a first conducting droplet having a first voltage;
a second conducting droplet having a second voltage; and
5 means for reversibly contacting said first droplet with said second droplet.
2. The electrical switch of claim 1 wherein said means for contacting comprises:
means for creating a first voltage differential between said first droplet
10 and a first electrode; and
means for creating a second voltage differential between said second droplet and a second electrode.
3. The apparatus of claim 2 wherein said means for creating a first voltage differential comprises at least a first voltage source electrically
15 connected to said first electrode and said first droplet, said first electrode electrically insulated from said first droplet.
4. The apparatus of claim 2 wherein said means for creating a second voltage potential comprises at least a first voltage source electrically connected to said second electrode and said second droplet, said second
20 electrode electrically insulated from said second droplet.
5. The apparatus of claim 1 wherein said means for reversibly contacting said first droplet with said second droplet comprises a heat source for increasing the pressure applied to said first droplet, thus causing said first droplet to contact said second droplet.
6. An electrical switch comprising:
25 a first conducting droplet having a first voltage;
a second conducting droplet having a second voltage;
a first electrode in proximity to said first conducting droplet;
a second electrode in proximity to said second conducting droplet;
at least a first voltage source for applying a voltage at least one of said
30 first conducting droplet and said second conducting droplet.

6. The electrical switch of claim 5 further comprising a first fluid surrounding said first conducting droplet, said fluid immiscible with said first conducting droplet.

7. The electrical switch of claim 6 further comprising a second fluid surrounding said first conducting droplet, said fluid immiscible with said first conducting droplet.

8. The electrical switch of claim 7 wherein said first fluid and said second fluid comprise the same fluid.

9. A method for use with a switch in an electrical circuit, said switch comprising a first conducting droplet of liquid and a second conducting droplet of liquid, said method comprising:

contacting said first conducting droplet of liquid with said second conducting droplet of liquid in a way such that an electrical path is formed between said first conducting droplet of liquid and said second conducting droplet of liquid.

10. The method of claim 10 further comprising:
separating said first conducting droplet of liquid from said second conducting droplet of liquid in a way such that said electrical path is removed.

11. A method for opening a switch in an electrical circuit, said switch having a first conducting droplet of liquid and a second conducting droplet of liquid wherein, when contacted, said first and second conducting droplets form an electrical path, said method comprising:

applying a first voltage differential between a first electrode and said first conducting droplet of liquid; and
applying a second voltage differential between a second electrode and said second conducting droplet of liquid,
wherein, upon applying said first voltage differential and said second voltage differential, said first conducting droplet is separated from said second conducting droplet, thus preventing an electrical current from flowing from

said first conducting droplet of liquid to said second conducting droplet of liquid.